

Remarks

1. Amendments

By the present Amendment, claims 1, 9, 10 and 15 have been amended. Upon entry of the present Amendment, claims 1 to 18 will be pending in the application.

"The compound represented by formula (I) having a group adsorptive to silver halide and a reducible group " is supported in the specification on page 7 to page 44. The adsorptive group to silver halide represented by A is supported in the specification on page 15, lines 13-25 to page 16, lines 1-5, and the reducible group represented by B is in the specification on page 10, lines 8-13. "1-phenyl-3-pyrazolidone" is a chemical description of "phenidone" which is a commercial trade mark.

2. Comments

Paragraph 4: rejection of claims 1-17 under 35 U.S.C.102(e)/103(a)

Claims 1-17 were rejected under 35 U.S.C.102(e) as anticipated by or, in the alternative, under 35 U.S.C.103(a) as obvious over Yamamoto et al..(US 2003/0224307 A1).

Applicant is filing a certified translation of priority documents of JP-2003-29780 and 2003-43851, which have Japanese priority dates prior to the filing of the 10/412,214(US 2003/0224307) application. It is respectfully submitted that the certified translations will remove the 10/412,214 application as prior art.

Paragraph 5: rejection of claims 1-8 under 35 U.S.C. 103(a)

Claims 1-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Okada et al.(US-6,120,983), Tsuzuki (US-5,677,121), Siga (US-4,332,889) and Tsukada (2002/0058220A1).

Okada discloses a compound of the formula $X-L_1-D$, wherein D is an electron donative group, X is an adsorption promoting group, and L_1 is a valence bond or linking group.

The electron donative group represented by D is preferably an amino group, a hydrazino group, hydroxylamino group, a hydroxamic acid group, a semicarbazido group or a hydroxyl-semicarbazido. More preferably, D is an amino group, a hydrazino group or semicarbazido group (column 5, lines 1-8).

The examples of the adsorption promoting group represented by X are thioamide, thiourea, thiosemicarbazide, mercapto group, heterocyclic mercapto group, disulfide group, nitrogenous heterocyclic group, or quaternary nitrogenous heterocyclic salt (column 6, lines 51-67 to column 7, lines 1-28).

The compound of formula $X-L_1-D$ in Okada ensures sufficient super-sensitization effects in the red to infrared region, especially in the practically advantageous infrared region in the range of 750nm to 1400nm (column 3, lines 10-14, column 28, lines 19-20). Super-sensitization is defined as:

"A spectral sensitivity of a dye is increased on addition of a second substance. If the added material does not itself sensitize in the spectral region of the sensitizing dye, any increase in spectral sensitivity is clearly superadditive and the addendum may be said to supersensitize the sensitizer." (T.H. James, *The theory of the photographic process*, 4th edition, p.260A, 1977, Macmillan Pub. Co.)

Please note that the above-quoted passage is attached hereto.

The compound having an adsorptive group to silver halide and a reducing group in the present invention is represented by the following formula (I):

$A-(W)_n-B$ formula (I)

wherein, the reducing group represented by A is a hydroxyurea group or 1-phenyl-3-pyrazolidone group.

The hydroxyurea group and 1-phenyl-3-pyrazolidone group are not disclosed in

the examples of the electron donative group represented by D in Okada.

The compound having an adsorptive group to silver halide and a reducing group in the present invention is a chemical sensitizer, which increases sensitivity notwithstanding the presence or absence of sensitizing dye. Example 1 in the present application discloses the effect of the compound to increase sensitivity to a blue laser having a light emission peak at 405nm in the absence of sensitizing dye. The compound having an adsorptive group to silver halide and a reducing group in the present invention also improves raw stock storability and image stability such as print-out resistance in the absence of sensitizing dye. Example 2 in the present application discloses similar effects as those in example 1 of the compound having an adsorption group to silver halide and a reducing group in the presence of sensitizing dye.

These effects of the compound of the present invention would not have been obvious in view of Okada. Therefore, Okada does not disclose or suggest the compound having an adsorption group to silver halide and a reducing group in the present invention.

Tsuzuki, Siga and Tsukada also do not disclose or suggest the compound having an adsorption group to silver halide and a reducing group in the present invention. Therefore, the combination of Okada et al.(US-6,120,983), Tsuzuki (US-5,677,121), Siga (US-4,332,889) and Tsukada (2002/0058220A1) would not teach nor suggest the present invention.

Paragraph 6: rejection of claims 9-11, and 15-16 under 35U.S.C.102(b) or 103(a)

Claims 9-11, and 15-16 were rejected under 35U.S.C.102(b) as anticipated by or, in the alternative, under 103(a) as obvious over Okada et al.(US-6,120,983).

As discussed in paragraph 5, Okada discloses a compound of the formula X-L₁-D, wherein D is an electron donative group, X is an adsorption promoting group, and L₁ is a valence bond or linking group, which ensures sufficient super-sensitization effects in the red to infrared region, but does not disclose the compound having a specific

adsorptive group and a specific reducing group in the present invention, nor the effects in the present invention.

Therefore, Okada does not disclose or suggest the present invention.

Paragraph 7: rejection of claims 12-14, and 17 under 35U.S.C.103(a)

Claims 12-14, and 17 were rejected under 35 U.S.C.103(a) as being unpatentable over as applied above paragraph 6, and further in view of Kimura (US-6,413,711).

As discussed above, Okada does not disclose or suggest the compound having an adsorptive group and a reducing group in the present invention. Kimura also does not disclose or suggest the compound having an adsorptive group and a reducing group in the present invention.

Therefore, the combination of Okada and Kimura would not achieve nor suggest the present invention.

Paragraph 9: rejection of claims 1-17 on the ground of nonstatutory obviousness-type double patenting

Claims 1-17 were rejected on the ground of nonstatutory obviousness-type double patenting as unpatentable over claims 1, 4-8, and 12-15 of copending Application No.10/412,214 in view of Tsuzuki (US 5,677,121) and Tsukada et al (US-2002/0058220 A1).

Application No.10/412,214 does not disclose or suggest the compound having an adsorptive group to silver halide and a reducing group in the present invention. Application No.10/412,214 discloses a compound that can be one-electron oxidized to provide a one-electron-oxidized product which further releases an electron or electrons, which is different in concept from the present invention. Moreover, 10/412,214 does not disclose a compound having a specific adsorptive group to silver halide and a specific reducing group in the present invention. Furthermore, no claims of 10/412,214

teach anything regarding Tg of the binder and a content of silver behenate in the silver salt of an organic acid.

Therefore, the combination of 10/412,214, Tsuzuki and Tsukada does not result in the material of the present invention.

It is respectfully requested that this rejection be withdrawn.

In view of the foregoing amendments and remarks, it is respectfully submitted that all of the pending claims are in condition for allowance. Favorable action is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Sheldon J. Moss', with a stylized flourish at the end.

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often exceeds that of either of the dyes separately at the concentration in the emulsion. Hence, if the concentration of one dye is chosen for optimum spectral sensitization, the addition of a second often depresses spectral sensitivity.

Sometimes, however, the spectral sensitivity of a dye is increased on addition of a second substance. If the added material does not itself sensitize in the spectral region of the sensitizer, any increase in spectral sensitivity is clearly superadditive and the addendum may be said to supersensitize the sensitizer. If two dyes sensitize for the same spectral region, supersensitization is indicated if a mixture of the two yields materially ($0.1-0.3 \log E$ or greater) more sensitivity at any wavelength than a concentration of either showing the same absorption as the mixture, or if the spectral sensitivity at any wavelength achieved by the mixture is materially greater than that obtainable from any concentration of either dye alone.

Although many examples of supersensitization are known, only a small fraction of random combinations of dyes is effective in this way. Typically, supersensitization can occur at a small concentration ratio of the additional dye to sensitizer. The dye present in the smaller amount may then be regarded as the supersensitizer for the other as sensitizer. The supersensitizing effect, however, may be mutual, the spectral sensitization of each dye being increased by the presence of the other.²⁵ Typical supersensitizers are either dyes or colorless compounds showing strong absorption bands in the near-ultraviolet spectral region associated with electron systems similar to those of dyes. Some family regularities are recognized in supersensitization; for example, supersensitizable 2,2'-monomethinecyanines are likely to respond to styryl bases as supersensitizers^{2b} and other families of compounds have been recognized as supersensitizers for those dyes.²⁶

Supersensitizing dyes may sensitize in their own right but frequently not with conspicuous efficiency. No general relationship between the chemical structures of sensitizer and supersensitizer has emerged, although relations between their oxidation-reduction properties have been recognized.

The absorption maximum of the supersensitizer may be either at shorter or longer wavelengths than that of the sensitizer—no overlap of absorption bands or of the fluorescence band of the sensitizer with the absorption band of the supersensitizer is required. Sensitizers in the J state of aggregation tend to respond particularly well to supersensitizers, but strong supersensitization of H-aggregated dyes is observed, and the effect may occur, less strongly, with sensitizers showing the modified molecular absorption band on the grain surface. In the presence of supersensitizers, the J-band of the sensitizer may broaden

and is frequently but not always displaced to shorter wavelengths.^{2b,9a,25,27a-c} If the concentration of the supersensitizer is raised sufficiently relative to that of the sensitizer, the J-band of the sensitizer may disappear.^{27d} From the relative concentrations of the two dyes at which this happens, it has been estimated that the minimum size of the J-aggregate is three molecules.^{27d}

Supersensitization of J-aggregated sensitizers may be detected at a molar ratio of supersensitizer to sensitizer of $1:10^4$; maximum efficiency of supersensitization usually occurs in the range $1:20$ to $1:1$.

Supersensitization may be achieved by a variety of dye-supersensitizer interactions.^{28a} The supersensitizer may increase the spectral absorption of the sensitizer by inducing or intensifying a J-band. In some combinations these changes in absorption can be associated with a mutual increase in adsorption of both members to the grain surface, as when the sensitizer and supersensitizer are ions of opposite charge.^{28b} The characteristic absorption band of the supersensitizer sometimes disappears in the supersensitization of a J-aggregated sensitizer, and the mixture shows an absorption band for the dye system as a whole, broadened and bathochromically shifted from the position of the J aggregate of the sensitizer alone, sometimes analogous to the mixed aggregates in aqueous solution described by Scheibe^{29a} and Ecker.^{29b}

Desensitization of the intrinsic response by a supersensitized combination may be less than that of the sensitizer alone, sometimes an important contribution to the total increase in sensitivity. The most important effect of the supersensitizer is, however, to increase the efficiency of spectral sensitization as measured by the relative quantum yield. All these effects may operate simultaneously to produce the observed supersensitizing effect.

Figure 10.3 illustrates an example of supersensitization caused almost entirely by an increase in the efficiency of sensitization, that of 1,1'-diethyl-2,2'-cyanine by the styryl base 2-(p-diethylamino-styryl)benzothiazole.^{29c} The spectral absorptance at the J maximum of the sensitizer is little changed by the presence of the supersensitizer, but the relative quantum yield of sensitization is increased from about 0.06 to nearly 1.0. The efficiency of sensitization by J-aggregates alone is frequently low but can be raised by supersensitization, as in this example, although some J aggregating dyes whose excited levels are relatively high with respect to the conduction band of silver halide show high sensitizing efficiency without the necessity of being supersensitized.^{27c}

The most spectacular relative increases in spectral sensitivity are observed in the supersensitization of highly nonplanar dyes of the 2,2'-quinocyanine series,